

Claims 11, 27, 40, and 43 have been cancelled.
Claims 1-10, 12-26, and 28-33 have been allowed.
Claims 34-39, 41-42, and 44 are rejected as being obvious.
Claim 44 is rejected as being indefinite.

5

Issues

- 1) Whether claims 34-39, 41-42, and 44 are non-obvious.
- 2) Whether claim 44 is definite.

10

Summary of Legal Authorities

In re Sang Su Le, 277 F.3d 1338, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002).
In re Goodwin, 576 F. 2d 375, 198 U.S.P.Q. 1 (CCPA 1978).
In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).
In re Sutherland, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984).
In re Ruff, 256 F.2d 590, 118 U.S.P.Q. 340 (CCPA 1958).
In re Dow Chemical, 837 F.2d 469, 5 U.S.P.Q.2d 1529 (Fed. Cir. 1988).

15

Arguments

35 U.S.C. § 112 Rejection

20 Amended claim 42 recites that “the gelled tube includes chromia particles” and thus, is now definite as to whether chromia particles are present therein. For this reason, Applicants respectfully request that the indefiniteness rejection be withdrawn.

35 U.S.C. § 103 Rejections

1. Summary of Claim 34

25 Claim 34 relates to a process for preparing optical fiber. The process includes drawing the fiber from a preform that includes a sol-gel silica tube. The process includes making the tube by forming a gelled tube from a silica dispersion, heating the gelled tube to a temperature ranging from 400 to 800°C, and treating the gelled tube with a gaseous mixture including one or more non-oxygenated sulfur halides while at the temperature.
30 Importantly, the treating step includes providing sufficient diffusion of the one or more

sulfur halides to achieve one of reduction of the size of refractory metal oxide particles in the gelled tube and reduction of the concentration of refractory metal oxide particles in the gelled tube.

5 2. **At page 2, the Office Action rejects claim 34 as obvious over U.S. Patent 5,356,447 ("Bhandarkar") in view of U.S. Patent 4,264,347 ("Shintani").**

A. Bhandarkar teaches a process for gas removal of refractory oxide particles from an unsintered porous sol-gel body. Bhandarkar, col. 1, line 64-68; col. 2, lines 49-50; claim 1. In his gas removal process, a gas reacts with the refractory oxide particles to produce a gaseous reaction product. Id. The gaseous reaction product flows out through pores in the unsintered body thereby removing the particles. Thus, the ability to react with refractory oxides to produce a gaseous reaction product is central to the reactive gas used in Bhandarkar's process.

15 Bhandarkar discloses processes that use thionyl chloride, i.e., SOCl_2 as a reactive component of the gas for removing the refractory oxide particles. Id. With respect to the reactive gas, Bhandarkar further states:

20 It is likely that SOCl_2 will be preferred as the prime or sole chlorine-containing ingredient. SOCl_2 is more effective than molecular chlorine and, thus far, appears unique. Explanation for effectiveness is likely related to presence of the moiety SO- Experimental findings strongly suggest that particle removal may be due to SO- to an equal or greater part than to released chlorine. Related halogen-containing compounds may serve to remove the refractory particles. Experimentation thus far has not identified anything of effectiveness equal to that of SOCl_2 . Materials considered include SOF_2 , S_2OCl_4 , $\text{S}_2\text{O}_3\text{Cl}_4$, SOBr_2 , PCl_5 , PCl_3 , and BCl_3 . Some of these, e.g. the B- and P-containing compounds may dope the silica glass to result in unwanted change in refractive index.

25 Bhandarkar, col. 3, line 64, to col. 4, line 13.

Thus, Bhandarkar states that gases as effective as SOCl_2 have not been identified. He further suggests that SOCl_2 may be unique in having a higher effectiveness than molecular chlorine. Also, he strongly suggests that the effectiveness of SOCl_2 is due in large part to its SO- moiety. Though Bhandarkar does explicitly list three compounds with no SO- moiety, i.e., PCl_5 , PCl_3 , and BCl_3 , he teaches that use of such "B- and P-containing compounds" may produce unwanted doping-induced changes in silica glass. Thus, Bhandarkar teaches against the only compounds that he lists as not having SO-

moieties. Bhandarkar does list other potentially reactive gases, i.e., SOF_2 , SOBr_2 , S_2OCl_4 , $\text{S}_2\text{O}_3\text{Cl}_4$. Each of these gases is related to the halide SOCl_2 by the presence of a SO-moiety. Importantly, not a single one of the reactive gases listed by Bhandarkar is a non-oxygenated sulfur halide. Thus, Bhandarkar teaches against the use of halogen-
5 containing compounds not having a SO-moiety. The teaching makes Bhandarkar an improper reference for an obvious rejection of claim 34, which recites sulfur halides not containing the SO-moiety.

B. The Office Action states:

Bhandarkar teaches the invention as claimed except for the use of specific gas.
10 Office Action, page 3, line 1.
At page 3, the Office Action states that modification of Bhandarkar's method to use the claimed gas is obvious. The claimed gas is "a mixture comprising one or more non-oxygenated sulfur halides".

It is well established that a case of prima facie obviousness must include a
15 specific prior art suggestion for combining or modifying references. See In re Fine, 837 F.2d 1071, 1075, 5 U.S.P.Q.2d 1596, 1599-60 (Fed. Cir. 1988); see also, In re Sang Su Le, 277 F.3d 1338, 1342-3, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002). The obviousness rejection relies on teachings of Shintani and Bhandarkar and thus, must point to a specific prior art suggestion to combine or modify these references.

20 The Office Action points to no specific suggestion from Bhandarkar or Shintani that would motivate either modifying Bhandarkar's gas removal method or would motivate combining his method with Shintani.

In particular, the Office Action fails to show that Bhandarkar identifies an unmet need that would suggest such a combination or modification. Instead, the Office Action
25 offers conclusory statements that the modification of Bhandarkar would result from routine experimentation. These conclusory statements are not substantiated by evidence of a suggestion in the prior art.

Similarly, while Shintani teaches the use of agents such as non-oxygenated sulfur halides to treat glass surface, Shintani's glass surface treatments are unrelated to the
30 removal of refractory oxide particles, which is central to Bhandarkar's method. In

particular, Shintani does not discuss removal of refractory oxide particles. Shintani nowhere suggests that his surface treating agents would react with refractory oxides. Thus, Shintani nowhere suggests that his non-oxygenated sulfur halides have the reactive property central to Bhandarkar's method.

5 For above reasons, Applicants respectfully assert that the Office Action has not provided a sufficient prior art suggestion for combining Shintani's and Bhandarkar's teachings as needed to establish a prima facie case of obviousness. Consequently, the obviousness rejection is no more than a hindsight reconstruction and as such is improper.

10 C. At page 3, the Office Action lists several independent grounds for its assertions that the modification of Bhandarkar's method to use a gas of Shintani is obvious. Below, each of the grounds is separately rebutted.

First, the Examiner states:

15 Instead, Bhandarkar discloses that some routine experimentation was performed to determine the most optimal gas (col. 4, line 8). It would have been obvious to perform additional routine experimentation to determine what the best gas is.

Office Action, page 3, lines 2-5.

20 The above argument provides no evidence of a prior art suggestion for the desirability of modifying Bhandarkar. A proper rejection must include a prior art suggestion of the desirability of modifying Bhandarkar, e.g., a specific problem in Bhandarkar's method. In re Sutherland, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) (underlining added). The mere fact that the prior art could have been modified is not relevant. In the absence of a suggestion of the desirability of a modification, arguing that further experimentation would have been obvious, is nothing but an "obvious to try" argument. Obvious to try arguments are improper grounds for obviousness rejections. See e.g., In re Goodwin, 576 F. 2d 375, 377, 198 U.S.P.Q. 1 (CCPA 1978); In re Fine, 837 F.2d 1071, 1075, 5 U.S.P.Q.2d 1596, 1599 (Fed. Cir. 1988).

30 Applicants also note that Bhandarkar's experiments to find the best gas do not of themselves provide a suggestion for modifying his process. For example, experiments do not of themselves motivate further experiments in the absence of some stated problem. Bhandarkar's teachings on his experiments with thionyl chloride do not suggest any

problem that would have motivated a quest for other reactive gases. See Bhandarkar, col. 3, line 64, to col. 4, line 13.

Next, the Office Action states that:

5 At col. 7, lines 16-43, col. 2, lines [sic] 28 Shintani teaches which gases can be used to remove impurities from silica fiber preforms."

Office Action, page 3, lines 5 - 6.

10 The Office Action misinterprets the cited sections of Shintani. At col. 2, lines 24-30, Shintani states that oxygen gas has been proposed to remove impurities rather than a non-oxygenated sulfur halide as recited in pending claim 34. At col. 7, lines 16-43, Shintani only states that the listed compounds are "surface treating agents". The properties that Shintani teaches for surface treating agents are not of themselves relevant to Bhandarkar's process. In particular, Shintani nowhere suggests his surface treating agents even react with refractory oxides as required for the reactive gas of Bhandarkar's process. Also, Shintani suggests uses of surface treating agents to produce a substance
15 that incorporates into the glass rather than to produce a gaseous reaction product as required in Bhandarkar's gas removal method. See e.g., Shintani, col. 5, lines 46-55, col. 6, lines 39-45. For these reasons, Applicants respectfully disagree with the Examiner's statement that Shintani teaches which gases may be used in Bhandarkar's process.

Next, the Office Action states that:

20 And/or [it]would have been obvious to use any of the Shintani gases for the Bhandarkar gases because it is the mere substitution of one known cleaning gas for another.

Office Action, page 3, lines 6-8 (underlining added).

25 Proper grounds for an obviousness rejection requires more than a showing that the invention follows from a mere substitution of an element A of a prior art device or process by a new element B. The rejection must additionally show, as existing in the prior art, the recognition that the new element B and the old element A were able to provide the same relevant function, i.e., the function in the prior art device or process. See e.g., M.P.E.P. § 2144.06; In re Ruff, 256 F.2d 590, 596-7, 118 U.S.P.Q. 340, 346
30 (CCPA 1958). Without a prior recognition that two elements can perform the same relevant function, the mere fact that the invention follows from a substitution of a known element in a known method does not of itself imply obviousness.

In the present case, the Office Action states that the invention follows from the substitution of a Shintani gas for a gas in Bhandarkar's method, because both Shintani's and Bhandarkar's gases were "known cleaning gases". Even if gases of both Bhandarkar and Shintani were recognized by the prior art as "cleaning gases", this is not sufficient to show that the substitution was obvious. Obviousness would also require that a gas of Shintani was known as being able to perform the function relevant to Bhandarkar's process. The relevant function for Bhandarkar's reactive gas is the ability to react with refractory oxides to produce a gaseous reaction product that can diffuse out through pores in the unsintered perform body. See Bhandarkar, col. 3, lines 22-23; col. 4, lines 19-27; claim 1. Liberation of the gaseous reaction product effectively removes the refractory particles from the porous body in Bhandarkar's process. See Declaration of Mandich and Reents, dated April 22, 2002, par. 5. The Office Action provides no evidence that Shintani's gases were known in the prior art to have such abilities. In particular, Shintani does not suggest that non-oxygenated sulfur halides react with refractory oxides as required in Bhandarkar's method. Also, Shintani does not teach that his surface treating agents react to form a gaseous product that can diffuse out through pores as in Bhandarkar's method. Shintani, col. 6, lines 39-45.

That the prior art recognizes Bhandarkar's and Shintani's gases as cleaning gases is not sufficient to support "mere substitution" as grounds for an obviousness rejection. The lack of a prior art teaching that Shintani's gases were capable of the function relevant to Bhandarkar's makes mere substitution an improper grounds for such a rejection.

The Office Action also states:

Further it is noted that the claim [sic] gas is a homomorph of the Bhandarkar preferred gas – it just has one substituted Group VIB atom (sulfur) for another Group VIB atom (oxygen).

Office Action, page 3, lines 8 – 10. (underlining added)

Applicants assume that the Examiner is referring to the fact that substitution of a sulfur atom in Bhandarkar's gas, i.e., SOCl_2 , produces S_2Cl_2 where S_2Cl_2 is a gas within the scope of the non-oxygenated sulfur halides recited in claim 34.

In chemistry, homomorph is generally defined as;

Homomorphs [chem.] Chemical molecules that are similar in size and shape, but not necessarily having other characteristics in common.

McGraw-Hill Dictionary of Science and Technical Terms, pages 761 (attached).

Substitution of a "homomorph" for a chemical compound in a prior art process is not a proper grounds for an obviousness rejection. Substitution of a homomorph involves replacing one chemical compound by another compound whose molecules have similar
5 "size and shape" rather than replacing the chemical compound by a compound with a similar chemical reactivity. The chemical reactivities rather than the molecular "sizes and shapes" are the relevant characteristics for the reactive gas of Bhandarkar's method.

Also, Applicants know of no legal precedent for an obviousness rejection based on the grounds of "substitution of a chemical homomorph". Applicants respectfully
10 request that the Examiner either supply a precedential basis or withdraw this rejection.

Applicants note that an earlier Office Action included a similarly worded obviousness rejection, which is repeated below:

15 Bhandarkar teaches the invention as claimed except for the use of the specific gas,...Further it is noted that the claim [sic] gas is a homolog of the Bhandarkar preferred gas – it just has one substituted Group VIB atom (sulfur) for another Group VIB atom (oxygen).

Office Action mailed Feb. 22, 2002, page 5, 3rd paragraph (underlining added).

In this earlier rejection, the place of the word "homomorph" was taken by the word "homolog". Chemical homologs, e.g., in a series of organic compounds, are very
20 different than chemical homomorphs. See e.g., The McGraw-Hill Dictionary of Science and Technical Terms, page 760 (attached). While obviousness rejections based on chemical homology are known, Applicants argued in the reply to the earlier Office Action that the claimed non-oxygenated sulfur halides were not chemical homologs of Bhandarkar's reactive gas. From the replacement of the word "homolog" in the earlier
25 Office Action by "homomorph" in the present Office Action, Applicants understand that the Examiner has abandoned his earlier chemical homology grounds for an obviousness rejection.

Finally, the Office Action states:

Further, col. 4, lines 19-26 spell out what one needs for a reactant.

30 Office Action, page 3, lines 10-11.

The cited text from Bhandarkar does not identify a candidate reactive gas type for Bhandarkar's method. Rather it lists reaction properties of the gas in his process. In

particular, it states that the properties include the ability to disassociate and cause disassociation of particulate refractive oxides and the ability to produce a gaseous reaction product. This teaching does not identify a type of gas with such reaction properties, and it clearly does not make obvious the substitution of non-oxygenated sulfur halides in his method.

3. **Claim 34 is rejected as obvious over a combination of Bhandarkar, Japanese Patent 1-164740 (Kanamori) and U.S. Patent 5,240,488 (Chandross). Office Action, page 4.**

On page 4, the Office Action states that:

Bhandarkar also teaches a step of dehydrating the porous body-prior to the treatment with an oxygenated sulfur halide.... Kanamori discloses that it is preferred to use S_2Cl_2 to dehydrate porous glass.... It would have been obvious to alter the Bhandarkar method by using the S_2Cl_2 mixed with inert gas as a dehydrating gas, for the advantages and reasons put forth by Kanamori.

Substituting the dehydration use of S_2Cl_2 , as suggested by Kanamori, in Bhandarkar's step for dehydroxylation produces a process in which a non-oxygenated sulfur halide dehydrates a gel body. As amended, claim 34 does not recite "reducing the concentration of water or hydroxyl groups". Instead, the amended claim recites "treating the tube with ... one or more non-oxygenated sulfur halides ... such that one effect ... of ... reducing the size of at least a portion of refractory metal oxide particles ... and reducing the concentration of refractory metal oxide particles ... , is achieved. The proposed prior art combination of Kanamori and Bhandarkar does not teach the claimed process, because the combination does not give a process that reduces the size or concentration of refractory metal oxide particles as recited in amended claim 34.

4. **Reply to Responses to Earlier Arguments**

A. On page 6, the Office Action states that "[t]he present rejection has no assertion or mention of any equivalency". On the other hand, the Office Action also states that:

And/or [it] would have been obvious to use any of the Shintani gases for the Bhandarkar gases because it is the mere substitution of one known cleaning gas for another.

Office Action, page 3, lines 6-8 (underlining added).

If the above argument is not a substitution of equivalents argument as described, e.g., in M.P.E.P. § 2144.06; in re Ruff, 256 F.2d 590, 596-7, 118 U.S.P.Q. 340, 346 (CCPA 1958), Applicants respectfully request that the Examiner provide the legal basis for the above rejection.

5 On the other hand, if the above-cited rejection is based on a substitution of equivalents argument, Applicants respectfully submit that the rejection is improper. The mere substitution of an element A in a prior art process with another known element B does not of itself provide grounds for obviousness. To find obviousness based on mere substitution grounds, the substitution must involve elements A and B that were known
10 prior art equivalents. Id. Otherwise, the substitution is not necessarily obvious.

Even if Shintani's and Bhandarkar's gases were both known as cleaning gases, that fact would not establish the equivalency of these two gases. In particular, "cleaning gas" is a very broad category, which includes gases that perform functions not relevant to Bhandarkar's method. For instance, cleaning away carbon impurities is not relevant to
15 Bhandarkar's method for removing refractory oxide particles. Gases such as HF clean away carbon particles, and are thus, "cleaning gases". See Shintani, col. 2, lines 10-15. Its property as a "cleaning gas" for carbon particles does not make HF an equivalent of Bhandarkar's reactive gas. Equivalency with respect to Bhandarkar's reactive gas requires that the equivalent gas be able to react with a refractory oxide to produce a
20 gaseous reaction product. The Office Action does not provide a prior art teaching to show that Shintani's gases were known to be able to perform such a function. For that reason, an obvious rejection grounded on a substitution of equivalents is improper.

B. At page 6, lines 6-7, the Office Action states that "arguments that the prior art
25 does not supply the teaching to combine ...were addressed in the previous Office Action." The previous Office Action stated:

It is also argued that the prior art does not suggest the modification and that one would not expect success in modifying Bhandarkar (via the Shintani reference). The prior art need not suggest the modification. *Changes in size, duplication of parts, and the like are obvious modifications* which do not require teachings from
30 the prior art. Routine experimentation is something that does not need a suggestion from the prior art.

Office Action, mailed Feb. 22, 2002, page 7, 2nd par. (italics added).

In response, the Applicants note that replacement of Bhandarkar's reactive gas by one of Shintani's gases is not a change in size, duplication of parts or the like. Also, the Office Action has provided no grounds for finding that a replacement of a reactive gas would result from routine experimentation. For example, where is the prior art teaching for a problem motivating such further experimentation?

The Federal Circuit has clearly stated that a case of prima facie obviousness must include a specific prior art suggestion for combining two references or for modifying a reference. See In re Fine, 837 F.2d 1071, 1075, 5 U.S.P.Q.2d 1596, 1599 (Fed. Cir. 1988); see also, In re Sang Su Le, 277 F.3d 1338, 1342-3, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002). The obviousness rejections based on Bhandarkar and Shintani do not provide such a prior art suggestion and thus, are improper.

C. On page 7, the Office Action states that
Most importantly at col. 4, lines 6-7 Bhandarkar states "Related halogen-containing compounds may serve to remove the refractory particles". Anyone reading that "Related halogen-containing compounds may serve to remove the refractory particles" would immediately realize that Bhandarkar is not completely sold that the best compound is the one that was found.... and thus no one would even think for a moment that related halogen-containing compounds may not serve to remove the refractory particles.

In the actual context, the cited phrase "Related halogen-containing compounds may serve to remove the refractory particles" has a different meaning than the meaning read in by the Examiner. The citation belongs to the following more complete citation:

It is likely that SOCl₂ will be preferred as the prime or sole chlorine-containing ingredient. SOCl₂ is more effective than molecular chlorine and, thus far, appears unique. ... Experimental findings strongly suggest that particle removal may be due to SO- to an equal or greater part than to released chlorine. Related halogen-containing compounds may serve to remove the refractory particles. Experimentation thus far has not identified anything of effectiveness equal to that of SOCl₂. Materials considered include SOF₂, S₂OCl₄, S₂O₃Cl₄, SOBr₂, PCl₅, PCl₃, and BCl₃. Some of these, e.g. the B-P-containing compounds may dope ... to result in unwanted change in refractive index.

Bhandarkar, col. 3, line 64, to col. 4, line 13 (underlining added).

The text cited by the Examiner is in a context that defines the scope of any suggestion concerning "related halogen-containing compounds". In this context, Bhandarkar suggests that SOCl_2 has the highest identified effectiveness. Bhandarkar also suggests that SOCl_2 's high effectiveness is very probably due to the SO-moiety. Bhandarkar, col. 3, line 64, to col. 4, line 6. Bhandarkar also states that he considered other compounds, i.e., SOF_2 , SOBr_2 , S_2OCl_4 , $\text{S}_2\text{O}_3\text{Cl}_4$, PCl_5 , PCl_3 , and BCl_3 , but he teaches that the P- and B- containing compounds on this list have unwanted effects. Bhandarkar, col. 4, lines 10-13. All other compounds on Bhandarkar's list include a SO-moiety, i.e., SOF_2 , SOBr_2 , S_2OCl_4 , $\text{S}_2\text{O}_3\text{Cl}_4$. In light of all this, the scope of related halogen-containing compounds in the citation, which the Examiner cites, should be interpreted with respect to Bhandarkar's preferred gas SOCl_2 . The scope of any suggestion that "related halogen-containing compounds may serve to remove the refractor particles" should be limited to halide compounds with a SO-moiety. This scope does not include non-oxygenated sulfur halides as in pending claim 34.

15

D. At page 8, the Office Action points out that Bhandarkar lists three compounds with no SO-moiety at col. 4, lines 10-11. Importantly, none of these compounds are sulfur halides as recited in pending claim 34. Setting aside this important distinction arguendo, it should be noted that although Bhandarkar does list the three compounds PCl_5 , PCl_3 , and BCl_3 , he also teaches against using them, i.e., he teaches that such "B- and P-containing compounds may dope the silica glass to result in unwanted change in refractive index." Bhandarkar, col. 4, lines 11-13 (underlining added). Thus, while Bhandarkar explicitly lists three compounds without SO-moieties, he also teaches against the desirability for such compounds. The simple listing of these three compounds in Bhandarkar is not inconsistent with a teaching away from them due to the fact that Bhandarkar attributes unwanted properties to them.

Applicants also emphasize that the Federal Circuit has said that, "[e]vidence that supports, rather than negates, patentability must be fairly considered." In re Dow Chemical, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531-32 (Fed. Cir. 1988). The Examiner must consider the prior art teachings for the advantageous and unique role of

SOCl_2 , when deciding whether the claimed method, which uses other types of compounds, i.e., non-oxygenated sulfur halides, is obvious.

5 E. At page 8, 2nd par., the Office Action states that the previous rejections do not propose combining the Bhandarkar method – with Shintani's use of oxygen. Since Shintani's methods use oxygen, it would not have been obvious to combine his teachings with Bhandarkar's gas removal process, which is performed without oxygen. See Bhandarkar, col. 1, lines 64-66; Shintani col. 2, lines 62-65.

10 F. At page 8, 3rd par., the Office Action states that the differences that Applicants have argued between bulk and surface treatments are immaterial, i.e., a matter of semantics. Applicants respectfully disagree, because removal of the reaction product in Bhandarkar's gas removal method involves diffusion of the reaction product out of the bulk via pores in the unsintered preform body. See Bhandarkar, col. 4, lines 23-26. On
15 the other hand Shintani does not suggest use of his agents in porous bodies. Shintani only suggests that his gases are surface treatment agents, which would not have to diffuse through the bulk of his glass objects. See Shintani, col. 5, lines 46-55; col. 6, lines 39-45. For this reason, Shintani's teachings should not be used to motivate use of his agents in Bhandarkar's method where the ability of reaction products to diffuse out of the porous
20 bulk material is important.

G. At page 9, 1st par., the Office Action states that "Shintani appears to be open to having a gaseous byproduct in addition to a nongaseous byproduct." Even if, arguendo, Shintani is "open" to having a gaseous byproduct, this does not negate the fact that
25 Shintani teaches uses where his agents are expected to produce substances that incorporate into the glass. See Shintani, col. 5, lines 46-55; col. 6, lines 39-45. Such uses would not motivate combining Shintani's teachings with those of Bhandarkar's method, in which a gaseous reaction product must be liberated.

For the above-stated reasons, Applicants respectfully submit that independent claim 34 is non-obvious. Claims 35-44 are non-obvious, because they depend on claim 34, which is non-obvious.

5 Applicants respectfully request allowance of claims 34-39, 41-42, and 44 as well as previously allowed claims 1-10, 12-26, 28-33.

In the event of any non-payment or improper payment of a required fee, the Commissioner is authorized to charge or to credit **Lucent Technologies Deposit Account No. 12-2325** to correct the error.

Respectfully submitted,

Mary L. Mandich
William D. Reents

10

By: John F. McCabe
John F. McCabe, Reg. No. 42,854
Tel: 908-582-6866

Date: Nov. 4, 2002

Lucent Technologies, Inc.
Docket Administrator
101 Crawford's Corner Road (Rm. 3J-219)
Holmdel, New Jersey 07733

15

Marked Up Claim Amendments

34. (twice amended) A process for preparing optical fiber, comprising the step of:
drawing fiber from a preform comprising a sol-gel silica tube, the tube formed by
5 a process including the steps of, prior to sintering the tube:
providing a silica dispersion,
forming from the dispersion a gelled tube comprising ~~water, hydroxyl groups, and~~
refractory metal oxide particles,
heating the entire gelled tube to a temperature ranging from 400 to 800°C and,
10 while the gelled tube is at the temperature, treating the gelled tube with a gaseous
mixture comprising one or more non-oxygenated sulfur halides, the treatment performed
for a time period that provides sufficient diffusion of the one or more sulfur halides into
the gelled tube such that at least one effect selected from the group consisting of ~~reducing~~
~~the concentration of water and hydroxyl groups in the tube,~~ reducing the size of at least a
15 portion of the refractory metal oxide particles in the gelled tube; and reducing the
concentration of the refractory metal oxide particles in the gelled tube, is achieved.

39. (twice amended) The process of claim 34, wherein the treatment reduces the
size of at least a portion of the refractory metal oxide particles in the gelled tube, reduces
the concentration of the refractory metal oxide particles in the gelled tube, or both
20 reduces the size of at least a portion of the refractory metal oxide particles in the gelled
tube and reduces the concentration of the refractory metal oxide particles in the gelled
tube.

42. (twice amended) The process of claim 34, wherein the gelled tube includes
chromia particles, wherein the gelled tube is subjected to a treatment with chlorine gas
prior to the treatment with the one or more sulfur halides, and wherein the chlorine gas
treatment performs at least one action selected from the group consisting of ~~reducing the~~
~~concentration of water and hydroxyl groups in the tube,~~ reducing the size of at least a
portion of the chromia particles in the gelled tube; and reducing the concentration of the
chromia particles in the gelled tube.